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GRT THE EFFECTS OF USER GROUPS ON SWIMMING POOL WATER QUALITY

Sukdeo K. Thorat and Mukund S. Salunke

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Abstract:-The study into the effect of user groups of different types on the water quality of swimming pool was undertaken. Samples were taken from three locations, before and after swimming of user groups. The samples were analyzed for Chlorine, temperature, pH and electrical conductivity. Pre-swim habits of swimmers were also recorded. It is observed that free chlorine concentration increases during use of pool. There is steady increase in EC, but not significant change in pH and temperature.

Keywords:water quality , swimming pool , physical exercise , Methodology.

INTRODUCTION

Now a days swimming is an extremely popular form of physical exercise all over world. The participation of Indian athlete in international competitions is very low percentage. The availability of swimming pools may can increases the participation in future. At present there are a wide range of guidance document and design standards published relating to the safe design of swimming pools. The focus of these document is the safe management of swimmers, bathers and the staff duties. The main objective of these standards is based on health and safety. The physical injuries can be prevented. For these the generic guidance is published but not any regulations yet. Water quality ranges and operating parameters are recommended and based on observations and past incidents.

The present study of user group evaluation is done at swimming pool owned by Adv.Manoharrao Nanasaheb Deshmukh college Rajur, Tal- Akole, Dist- Ahmednagar .The size of pool is 50m in length,21m in breadth, 6Ft in depth and 4 Ft in shallow depth. The main pool is along with small swimming pool having 21 m length,15 breadth and 3 Ft in depth. The pool is semi Olympic size having eights lanes with total capacity of `1900 m3. The water treatment plant consists of a coarse Steiner, sand filters and low pressure UV unit. The pool operates on a 6 hours turnover. Sodium hydrochloride is used to dosing the system to maintain required free chlorine and HCL for pH amendments. The pool temperature is not controlled. The activities range from learn to swim.

METHODOLOGY

The purpose of this study was to assess whether the user groups activities have different effects on the swimming pool water quality. It is advices operator to monitor the pH ,TDS, chlorine and combined chlorine levels in the swimming pool on a regular basis as there are no infecting properties of water. The increase in numbers of users increases the contamination that reduces the percentage of chlorine. All these parameters were monitored during and after use of swimming pool. The study was undertaken on Sunday. Every time by moving the boom from 40 m to 20 m as well as raising the floor from 1 m to 0.25 m ,water quality monitored at 3 different locations. The locations were at equal distances from each other. Samples were taken before and after use of swimming pool. Users load, time and users habits regarding pre-bath were recorded. All the collected samples were tested in laboratory.

RESULT AND DISCUSSION

It is significant factor affecting the quality of water. An increase in numbers of user groups increases the amount of materials of human origin including sweat ,hair, facial matter and cosmetics also .Users load at each

location is shown in figure .1.

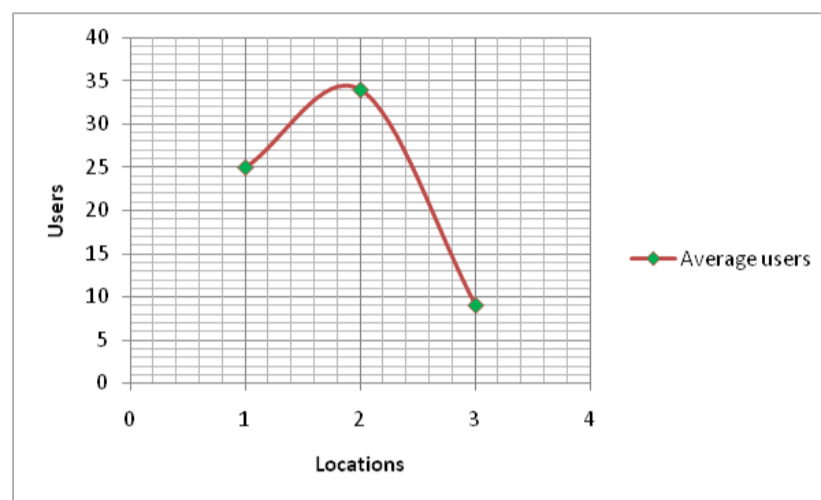


Figure .1. User Load at locations under observation.

The use of dedicated swimming costumes are appeared to common amongst the users. Some of parents were observed escorting their children to poolside for guidance, resulting contamination due to their shoes and chappals. The entry of instructor in pool without showering introduces contamination.

Samples were taken before and after use of swimming pool. Each sample was analyzed for free chlorine. There is no any correlation in use of swimming pool and in free chlorine concentration .This free chlorine is automatically controlled by controller in dosing the sodium hypochlorite based on the free chlorine concentration in the balance tank. The change in it were more during the off-peak period. Sometimes after swimming white markings were observed on the skin of users. This is may due to a combination of the significant water movements caused by the floor movements and the large variations in bather loads at morning.

The combined chlorine concentration of samples was assessed at three locations. At the start of day the combined chlorine concentration is found to be elevated. This is due to overnight reduced rate. There is reduction in combined chlorine concentration at three locations. The numbers of users and the movement of boom affect the concentration. As numbers of user increases the combined chlorine concentration increases. The removal of surface water reduces the concentration. The pH of swimming pool water is maintained by dosing of hydrochloric acid. pH value remains constant throughout the day. It is found that overall conductivity increases from 7? S/cm to 12? S/cm per day. During use of swimming pool and as number of user increases the conductivity also fluctuates. It is observed that temperature of water of swimming pool changes time to time .At noon temperature increases and at morning it decreases. This is may due to sunlight.

CONCLUSION

This study concludes that the need of further study and an awareness campaign regarding pre-bathing habits of user groups. During maximum use of swimming pool there is significant increase in combined chlorine levels. There is better water quality during night time and rest periods. The free chlorine levels increases during morning session. The conductivity of the swimming pool water was found to increase slightly during study periods. For the detailed study of swimming pool water quality, more study and information regarding chemical and biological analysis is needed.

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